

MODELING REGIONAL AND COMMUNITY RESILIENCE



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OUTLINE

- Motivation for the work
- What is resiliency and what are the factors that contribute to it?
- The ARISE program
- Where do we get the data?
- Examples of ARISE studies
- Challenges faced in performing resiliency assessments
- Where would we like to go?

MOTIVATION FOR THE WORK

- Countries around the world are facing stress from a number of sources and are looking for ways to be better able to respond to these stresses – they are seeking opportunities to be more resilient.
- Our original resiliency analysis work was driven by a DoD sponsor who wanted to analyze the resiliency of countries in the Pacific Rim and to develop plans to enhance resiliency.
 - If countries are more resilient, they are better able to respond themselves to disruptions like natural disasters and would require less assistance from external sources.
 - Reducing the requirement for U.S. assistance during disruptions ultimately supports U.S. national interests.

WHAT IS RESILIENCY?

- The literature includes multiple definitions for resiliency. For the purposes of this effort, resiliency is defined as:

“The ability of an entity — e.g., asset, organization, community, region — to anticipate, resist, absorb, respond to, adapt to, and recover from a disturbance from either natural or man-made events.”

WHAT FACTORS CONTRIBUTE TO RESILIENCY?



ARISE – ANALYSIS OF RESILIENCY FOR INTEGRATED SYSTEM EFFECTIVENESS

- The original resiliency work that began in 2011 has evolved into a larger effort focused on integrated community resilience.

Resilient Communities

Basic Sustainability

A community's or society's **capacity to meet its basic needs** and those of its members.

Social Responsibility

A community or society's **will to improve quality of life** beyond basic needs.

Social Opportunity

Services and functionality that provide opportunities to **improve the quality of life** beyond the baseline.

Secure Environment

The ability to **provide** for the physical, health, food, and territorial **security of all individuals and resources** in the community or society.

These Characteristics Represent the Goals You Want to Achieve when Engaging in Resiliency Enhancing Activities

ARISE IS BASED ON A FRAMEWORK OF PILLARS THAT PROMOTE COMMUNITY/REGIONAL RESILIENCE

The ARISE Resiliency Framework

Enhance
Societal
Capacity

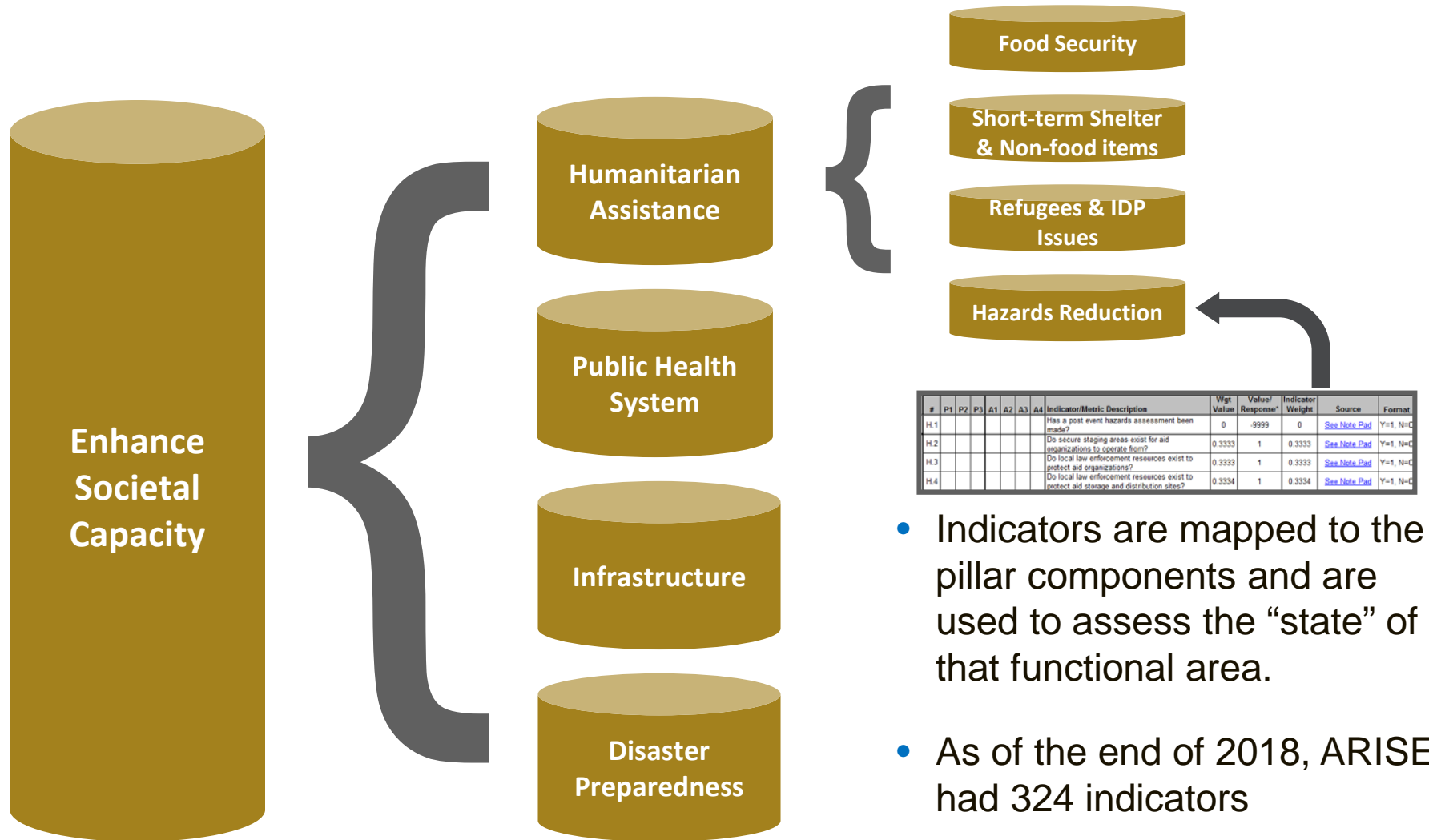
Strengthen
Knowledge
Assets

Enable
Resource
Independence

Create Social
Cohesion

Foster Good
Governance

ARISE PILLARS ARE BROKEN DOWN INTO FACTORS THAT ADDRESS DIFFERENT RESILIENCE ELEMENTS



- Indicators are mapped to the pillar components and are used to assess the “state” of that functional area.
- As of the end of 2018, ARISE had 324 indicators

DATA USED TO SUPPORT ARISE ASSESSMENTS

- All of our studies have used data from public domain sources.
- Most of the data are at the country levels and qualitative.

Primary Data Sources



Research Index Data Sources



Other Sources

- News
- Reports
- Social Media




Static
Objective
Quantitative

Qualitative
Subjective
Contextual



ARISE PROVIDES HIGH LEVEL ASSESSMENTS WITH A VARIETY OF DRILL DOWN OPTIONS

Updated: 20 September 2018



		Enhance Societal Capacity Pillar														
		0.30														
		0.20			0.35						0.46			0.19		
		Humanitarian Assistance			Public Health Systems						Infrastructure			Disaster Preparedness		
		0.17	0.16	0.38	0.22	0.15	0.15	0.39	0.45	0.44	0.88	0.75	0.00	0.53	0.58	1.00
		Food Security	Refugees and IDPs	Hazards Reduction	Potable Water	Sanitation	Nutrition	Health Facilities	Health Supplies & Equipment	Human Resource Capacity	Infectious Disease Management	Transportation Network	Telecommunications	Energy	Emergency Management	Early Warning Systems
		0.17	0.16		0.87	0.61	0.15	0.67	0.50			0.50		0.60		
		1	2		2	2	6	3	2			2		2		
Capacity to Meet Basic Needs - A community or society's capacity to meet its basic needs and those of its members.	0.16	0.47														
			0.00		0.00	0.00				0.50	1.00			0.00	1.00	
			2		1	1				1	1	4		1	1	
Will to Improve - A community or society's will to improve quality of life beyond basic needs.	0.28	0.36														
			0.38		0.00	0.00		0.25	0.40	0.38		1.00	0.00	1.00	0.25	
			4		1	1		2	5	3		1	4	1	2	
Provide Services & Functionality to Improve - Services and functionality that provide opportunities to improve the quality of life beyond the baseline.	0.23	0.37														
			0.00	0.38	0.00	0.00					0.75				0.50	1.00
			2	4	2	1					2	1	1	1	6	2
Maintain Services & Functionality When Perturbed - The ability to provide for the physical, health, food, and territorial security of all individuals and resources in the community/society when threatened.	0.09	0.38														
		10														

This is the number of indicators supporting the given pillar and resilience characteristic.

This indicates that no data were available.

The color coding is based on a user-defined scale.

ARISE STUDIES (CONT.) – HYOGO FRAMEWORK FOR ACTION OUTCOMES ANALYSIS

Hyogo Framework for Action Priorities						
	All Priorities	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5
Africa						
Average	2.75	2.95	2.95	2.58	2.63	2.77
Kenya	4.43	4.00	4.75	4.75	4.67	4.00
Nigeria	3.90	4.00	3.50	4.00	4.00	4.00
Sierra Leone	3.62	3.00	4.00	3.50	3.83	3.75
Zambia	3.58	3.75	3.00	2.75	4.17	4.25
Senegal	3.55	2.75	3.75	3.25	3.50	4.50
Algeria	3.48	3.50	3.25	3.00	4.17	3.50
Cape Verde	3.48	3.50	3.25	3.75	3.17	3.75
Madagascar	3.43	3.75	3.50	3.75	2.67	3.50
Ghana	3.33	3.25	3.25	2.75	3.67	3.75
Tanzania (Republic)	3.30	3.50	3.00	3.00	3.00	4.00
Mozambique	3.27	4.00	3.25	2.75	3.33	3.00
Mauritius	3.15	3.50	3.50	3.00	2.50	3.25
Morocco	3.15	3.00	3.00	3.75	3.50	2.50
Botswana	3.05	3.00	3.50	2.75	2.50	3.50
Burundi	2.60	3.75	2.50	1.75	2.50	2.50
Malawi	2.35	1.75	2.50	2.00	3.00	2.50
Cote d'Ivoire	1.92	2.50	2.50	1.25	1.83	1.50
Comoros	1.90	1.75	2.50	2.25	1.50	1.50
Lesotho	1.85	2.50	2.00	2.00	1.00	1.75
Guinea-Bissau	1.03	1.00	1.00	1.00	1.17	1.00

Priority 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

Priority 2: Identify, assess and monitor disaster risks and enhance early warning

Priority 3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels.

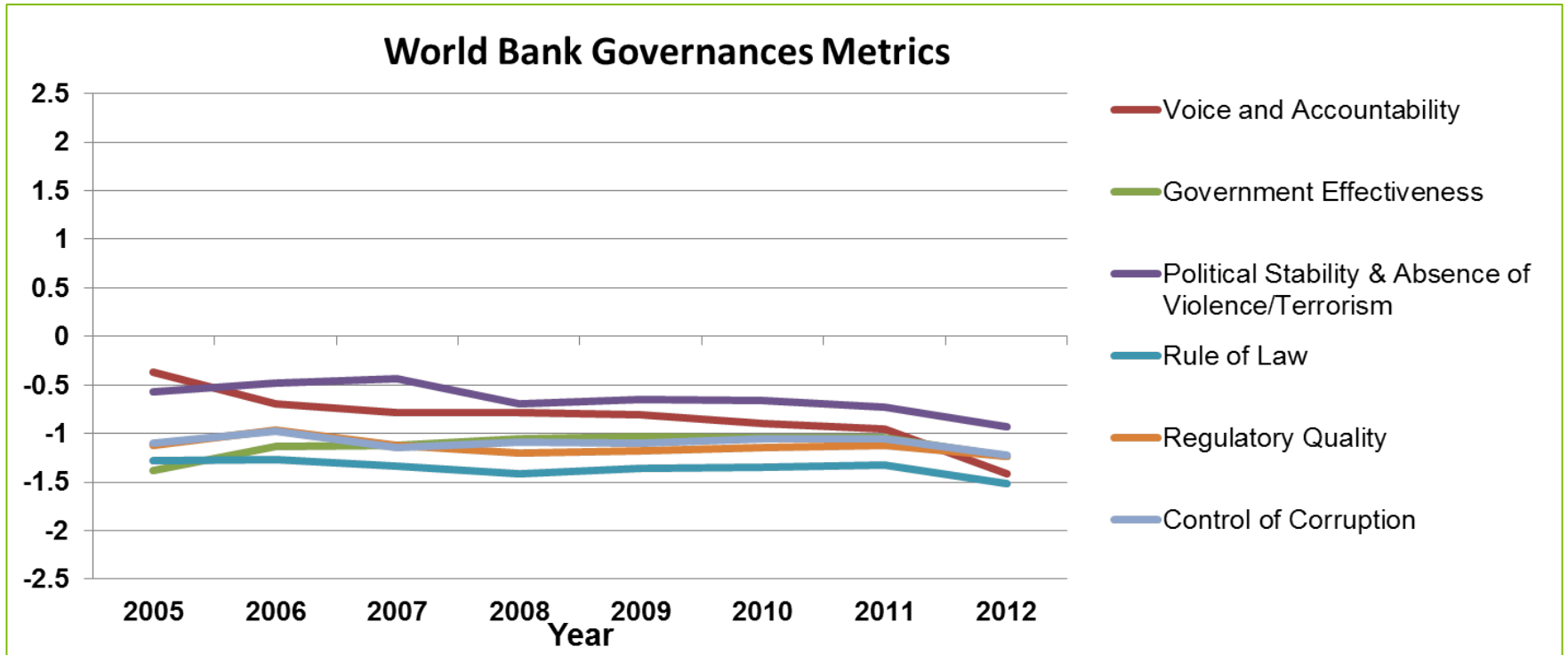
Priority 4: Reduce the underlying risk factors.

Priority 5: Strengthen disaster preparedness for effective response at all levels.

- The UN's Hyogo Framework for Action (HFA) was originally developed to assist countries in preparing for natural disasters and impacts from climate change.
- In 2014, when the HFA was ending,* an Argonne assessment of how well countries had met the HFA goals revealed some anomalous results.

*The HFA was replaced by the 15-year Sendai Framework for Action effort.

EXAMPLES OF ARISE STUDIES – HFA GUINEA-BISSAU DEEP DIVE

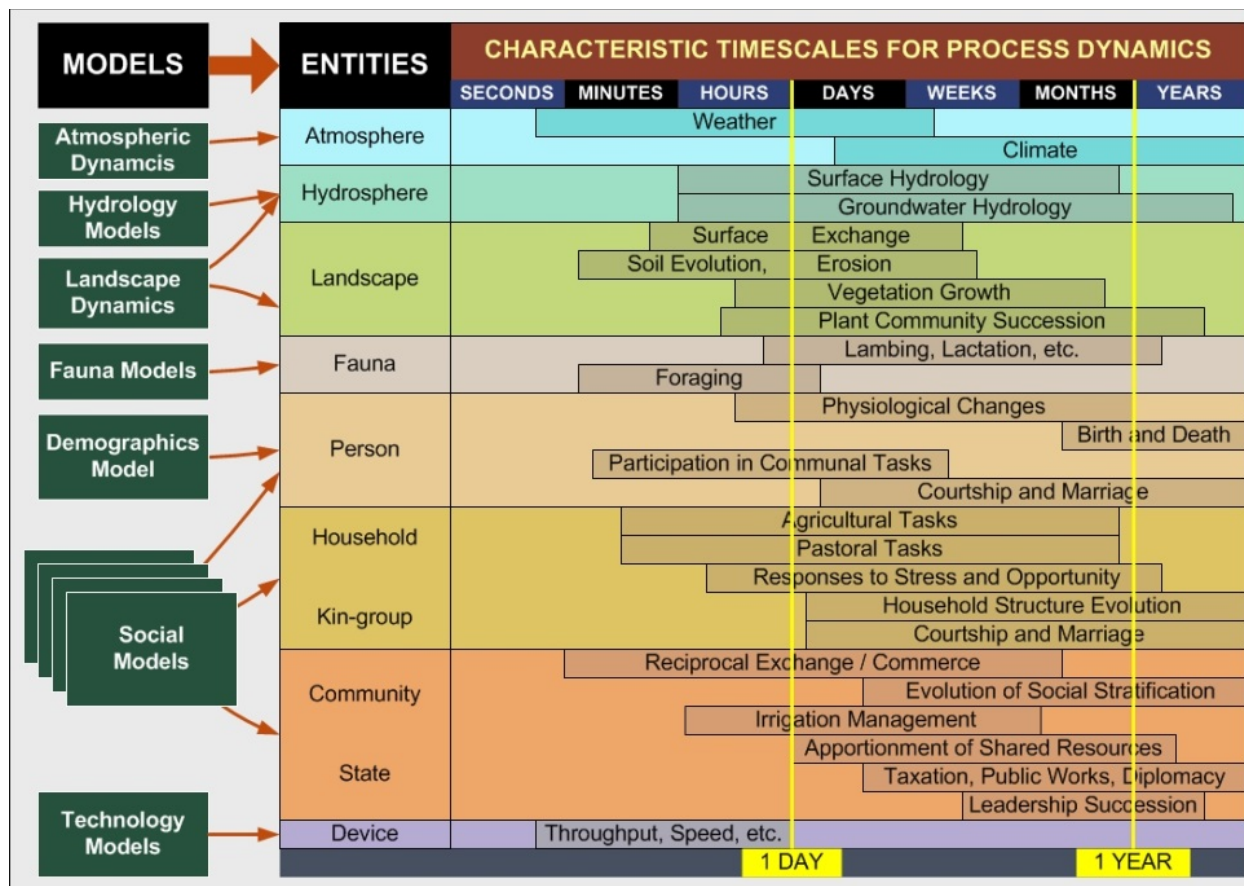


UN Human Development Index Metrics

2012 Human Development Index (HD) and Ranking	Infant Mortality Rate (Per 1,000 live births)	Maternal Mortality Rate (Per 1,000 live births)	Life Expectancy (Yrs)	Population in Multi-Dimensional Poverty (%)	2011 Expected Years of Schooling	2010/2015 Annual Population Growth (%)
0.355, 176	92	n/a	48.6	n/a	9.5	2.1

CHALLENGES IN RESILIENCY ANALYSES

- Enhancing resiliency involves changing social and cultural processes that can be **generational** in scope – way beyond normal governmental/military planning cycles.



WHERE WOULD WE LIKE TO GO WITH NEW OR BETTER DATA?

- We already have country level assessments for 187 countries that incorporates a number of “standard” data sources:
 - UN Human Development Index data
 - World Bank Governance assessments
 - Failed States Index
 - UN Food and Agriculture Organization
 - CIA World Factbook
 - Sovereign Credit Ratings
 - ...
- We would like to add more spatial granularity, but this could be a daunting “boots on the ground” activity.

QUESTIONS?

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